**WE CLAIM:**

1. An E-Class oscillator configured to lock to an external reference signal comprising:

a tank circuit configured to oscillate;

a first switching circuit configured to repeatedly add energy into the tank circuit in response to a drive signal to maintain the oscillation of the tank circuit;

a second switching circuit configured to controllably alter the oscillation frequency of the tank circuit; and

a controller configured to generate a control signal based on the external reference signal and based on the drive signal that causes the second switching circuit to repeatedly alter the oscillation frequency of the tank circuit in a manner that causes the oscillator to lock to the external reference signal.

2. The E-Class oscillator of Claim 1 wherein the controller includes a D memory.

3. The E-Class oscillator of Claim 2 wherein the D memory has a clear input and wherein the clear input is configured to be in communication with the external reference signal.

4. The E-Class oscillator of Claim 2 wherein the D memory has a clock input and wherein the clock input is configured to be in communication with the drive signal.

5. The E-Class oscillator of Claim 4 wherein the D memory has a clear input and wherein the clear input is configured to be in communication with the external reference signal.

6. The E-Class oscillator of Claim 1 further including a feedback circuit in communication with the tank circuit that is configured to generate the drive signal.

7. The E-Class oscillator of Claim 6 wherein the feedback circuit includes a zero crossing detector and a pulse generator circuit.

8. The E-Class oscillator of Claim 7 wherein the feedback circuit includes a phase shifter circuit.

9. The E-Class oscillator of Claim 1 wherein the controller is configured to repeatedly alter the oscillation frequency by repeatedly increasing the frequency in response to either the external reference signal or to the drive signal and by repeatedly decreasing the frequency in response to the other of these signals.

10. The E-Class oscillator of Claim 9 further including a reactance that is configured to be added to and removed from the tank circuit by the second switching circuit.

11. The E-Class oscillator of Claim 10 wherein the controller is configured to repeatedly add the reactance to the tank circuit in response to either the external reference signal or to the drive signal and to repeatedly remove the reactance from the tank circuit in response to the other of these signals.

12. A process for locking an E class oscillator having a tank circuit to an external reference signal comprising:

repeatedly adding energy into the tank circuit in response to a drive signal; and

repeatedly altering the oscillation frequency of the tank circuit in response to the drive signal and the external reference signal in a manner that causes the oscillator to lock to the external reference signal.

13. The process of Claim 12 wherein the oscillator also includes a reactance and wherein the repeatedly altering the oscillation frequency includes:

repeatedly adding the reactance to the tank circuit in response to either the external reference signal or to the drive signal; and

repeatedly removing the reactance from the tank circuit in response to the other of these signals.

14. The process of Claim 12 wherein the frequency of the external reference signal is modulated and wherein the frequency of the E-Class oscillator tracks the modulation.

15. The process of Claim 12 wherein the phase of the external reference signal is modulated and wherein the phase of the E-Class oscillator tracks the modulation.

16. A process for modulating the phase of an E-Class oscillator in accordance with the modulated phase of an external reference signal comprising repeatedly altering the frequency of the oscillator in response to the external reference signal in a manner that causes the phase of the oscillator to substantially track changes in the phase of the external reference signal.

17. The process of Claim 16 wherein the E-Class oscillator includes a tank circuit and wherein the repeatedly altering the oscillation frequency includes repeatedly adding the reactance to and removing it from the tank circuit.